



Bringing Modeling to the People through the Kentucky Watershed Modeling Information Portal (KWMIP)

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Special Acknowledgement

This project would not have been possible
without the vision and dedication of
Susan Carson Lambert.

Ms. Lambert retired from state service
on August 1, 2005.



Kentucky Watershed Modeling Information Portal

Presentation Overview

- Background
- Project Overview
- Partners
- Objectives, Products, Status
- Leveraging Data and Projects
- Summary



Watershed Models and Modeling Needs

What is a watershed model?

- ❑ Simulate hydrologic and/or pollutant processes at a watershed scale
- ❑ Examples: LSPC, SWAT, CE-QUAL2K, HSPF

How are watershed models used?

- ❑ Total Maximum Daily Loads (TMDL's)
- ❑ Watershed-based Plans
- ❑ Evaluate effectiveness of NPS management measures
- ❑ Water budgets



Watershed Modeling Needs & Issues

Anticipated increase in use of models

Almost 2,000 impaired pollutant/waterbodies in KY

Time and expense to compile and format model input data

Inconsistent approaches especially for flow in ungaged streams, precipitation and temperature.

Water resources managers need training on utility and application of today's watershed models.

Modelers need training on models, new datasets and KWMIP.

E-commerce opportunity to provide long-term, reliable access to formatted data.



KWMIP Award

- EPA Environmental Information Exchange Network Challenge Grant
- \$750,000 Cooperative Agreement between USEPA and KY Commonwealth Office of Technology (COT)
- Project Period: October 2004 – September 2006

Grant Link: [*http://www.epa.gov/Networkg/*](http://www.epa.gov/Networkg/)

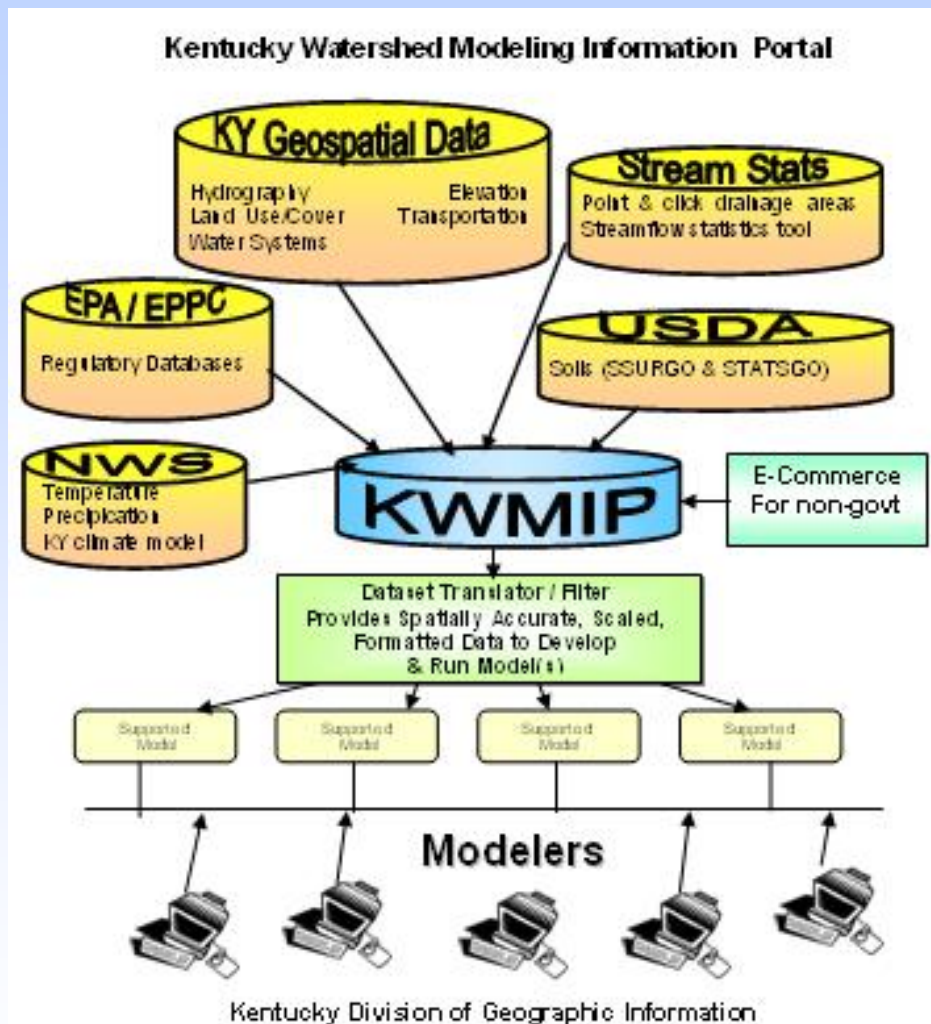
Exchange Network Link:

[*http://www.exchangenetwork.net/index.htm*](http://www.exchangenetwork.net/index.htm)

Site URL: [*http://kwmip.ky.gov*](http://kwmip.ky.gov)



KWMIP Vision



KWMIP In Action

- Trained modelers select from 2 to 5 supported models and a watershed or area of interest.
- KWMIP locates necessary data, clips, formats and ships to modeler for use.



KWMIP Partners

U.S. EPA Grantor

Gary Harp, DGI Principal Investigator

Mark Ayers
USGS Water
Co-awardee
Precipitation &
temperature
modeling

Nick VanDriel
USGS
Geography
Co-awardee
Data and web
mapping
services

Sam Bacharach, Open
GeoSpatial Consortium
(OGC) Co-awardee

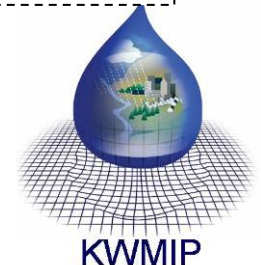
User Needs Assessment,
Portal Development,
Testing, Installation

Margaret Shanks
KY DEP
Co-awardee
Project input and
review

Lee Tompkins
Kentucky.Gov
E-Commerce

OGC Sub-Contractors
Karen Schaffer, FMSM -
Project Coordination
Andrew Brenner,
Sanborn Solutions -
Web-Enable EPA GeoBook

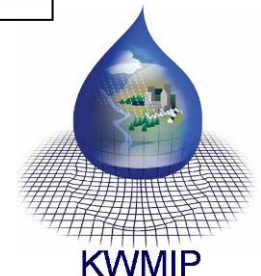
Technical Advisory Group
(TAG)



KWMIP Objectives and Products

- Improve efficiency and quality for 2-5 watershed models.
- Leverage data and projects.
- Interface with Environmental Information Exchange Network
- Allow for future inclusion/expansion to KY node (TEMPO/COMPASS).
- Train KY water resource managers and modelers.
- Vendor neutral links to GIS and databases
- E-commerce for long term viability.

Ultimate Goal: Increase watershed model use, quality and efficiency in Kentucky!



KWMIP Approach

User Needs Assessment – ID watershed modeling needs.

- Target users, Technical Advisory Group (TAG) & project partners

Use Cases for System Design -

- User Needs Assessment and Use Case Scenarios
- Results shape System Design

Build and Test Pilot System –

- Built by OGC; tested by partners and TAG
- Include statewide precipitation & temperature model, built by USGS

Install Operational System on COT servers.



KWMIP Approach

Train – Water resources managers and modelers

Communication – Broad public and private sector

Maintain and Finance Operational System –

- Long-term O&M plan will be developed
- Finance with e-commerce fees for private sector users
- Government use will be free

Web-Enable GeoBook – EPA's Ecological Framework
GeoBook for Southeast will be web-enabled.



KWMIP Status

KDOW Modeling Needs Meeting – preliminary identification of needs in TMDL and Watershed programs

Technical Advisory Group

~80 invitations mailed to

- Federal, state, local government
- Academic modelers, karst, GIS, geomorphic experts
- Professional water resources associations
- Consulting firms

User needs meetings: August 26th and 29th



KWMIP Leverages Data and Projects

COT: Kentucky Landscape Snapshot

Project Period 2002 – 2005

KLS Objectives

- Provide **updated data** for land use/land cover
- Provide **detailed forest and wetland** data
- Provide input data for federal, state and local **land planning**
- Develop and provide **tools and training**
- Promote use of **remote sensing imagery and methods**



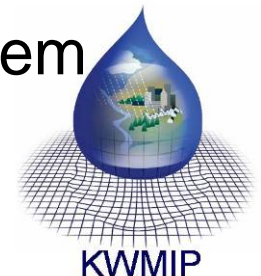
KWMIP Leverages Data and Projects

COT: Kentucky Landscape Census (KLC)

NASA grant to "Take GIS to the People of Kentucky"

KLC Objectives

- Land use **change detection tool**
- Browser tool for **visualization, query and reporting**
- Maintain and update **National Map** layers
- Provide **training** on uses of remote sensing data
- **Pilot data portal** with county governments
- **Business plan** for long-term support for the system



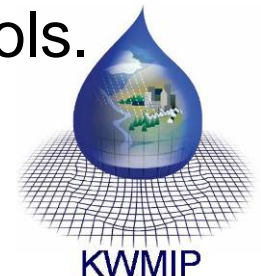
KWMIP Leverages Data and Projects

USGS: Stream Stats

- Point & click **drainage areas**
- Low and high **flow statistics** for 1:24K NHD streams
- 1st order estimates of N & P (**SPARROW**).
- <http://kygeonet.ky.gov/kyhydro/viewer.htm> Stream Data Layer

Multi-Agency Karst Hydrology Initiative

- Improve watershed boundaries
- Karst system mapping
- Improve understanding of surface & ground water interactions
- Develop/ improve analytical & decision support tools.



KWMIP Leverages Data and Projects

USEPA Environmental Information Exchange Network

- KDEP databases – TEMPO & COMPASS
- EPA databases – STORET, PCS

EPA Region IV Modeling Toolbox & BASINS

- Databases, GIS, Models
- Currently has links to static data & GIS
- www.epa.gov/athens/wwqtsc

KY GeoNet

- Numerous KY geographic data layers useful for modeling
- www.kygeonet.ky.gov



Summary

KLS has delivered

- An accurate baseline snapshot of the landscape
- High resolution imagery and land cover for selected counties
- Tool for land owners for forest management
- Web mapping tool for county government for planning and data access

KLC will expand

- OGC interoperability portal
- Data access to a new tier of counties and cities
- Remote sensing analysis and on-line change detection tools

KWMIP will enhance

- Model use and consistency with clipped and formatted watershed model input data
- Use of watershed models in Kentucky decision-making



Questions and Contacts

<http://kwmip.ky.gov/>

<http://klc.ky.gov>

<http://kls.ky.gov>

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Government Technical Lead: Demetrio Zourarakis, Ph.D. demetrio.zourarakis@ky.gov

Project Coordinator: Karen Schaffer, FMSM Engineers, kschaffer@fmsm.com

